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MUNICIPAL ADULTICIDING TO PREVENT THE SPREAD OF WEST NILE VIRUS

Life Cycle of the Mosquito

Mosquitoes have a four-stage life cycle: egg, larva, pupa and adult. Only female mosquitoes need a blood meal as they develop their eggs. Both males and females feed on nectar for their food source. During its life, a female mosquito may take two or three blood meals and develop several hundred eggs each time. Mosquitoes may live four to eight weeks. All female mosquitoes lay eggs in or around stagnant water. The eggs hatch into larvae and take about seven days to develop into adults. At the water surface, the larva changes to a pupa before emerging as an adult mosquito.

Preventing Exposure

Avoiding being bitten by mosquitoes is the first line of defence against West Nile Virus. Homeowners are strongly encouraged to remove breeding sites and practice personal protection against mosquitoes.

Some municipalities will be larviciding some stagnant water bodies such as catch basins, stormwater detention ponds and ditches to prevent the development and dispersal of adult mosquitoes.

Deciding to Adulticide

The use of adulticides might be necessary only when there is significant risk to human health from West Nile Virus and when local officials have decided that other disease prevention or mosquito control measures have not been sufficient to stop the spread of the virus. The decision on whether or not to apply adulticides will be made by the local Medical Officer of Health based on the results of a risk assessment and guidelines provided in Ontario Regulation

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199/03. The local risk assessment will be based in part on the monitoring and surveillance data of West Nile Virus presence in adult mosquitoes, and presence of West Nile disease in birds and humans.

While homeowners may wish to spray to kill adult mosquitoes themselves, they are encouraged to rely on municipal programs for mosquito control measures where necessary. A municipal adulticiding program will cover a larger area and be more effective at reducing adult mosquito populations that have the ability to act as carriers of West Nile Virus than individual homeowner attempts to control mosquitoes with pesticides. Adulticides available for use by homeowners in their yard or garden have limited effectiveness as mosquitoes can easily fly from one property to another.

Malathion

Malathion is the product that will be used by municipalities if the local Medical Officer of Health decides an adulticiding program is needed. Malathion kills mosquitoes and other flying insects upon contact. It provides control for only a short period of time so it may be re-applied in places where mosquitoes are still maturing and active.

Health Canada's Pest Management Regulatory Agency (PMRA) has recently reviewed malathion and reconfirmed its use for mosquito control. The PMRA's conclusions reconfirm that the use of malathion for adult mosquito control in residential areas, using ground or aerial ultra-low volume application, will not pose a human health or environmental concern. Refer to PMRA's fact sheet on malathion for additional information (http://www.hc-sc.gc.ca/pmra-arla/english/pdf/fact/fs_malathion-e.pdf).

The application of malathion is regulated under Ontario Regulation 63/09 of the *Pesticides Act*, and when used in large-scale municipal mosquito control programs, it must be applied by licensed applicators. Under this regulation, residents of a neighbourhood or area where a decision is made to apply malathion must be notified no less than 48 hours and no more than 7 days in advance by either newspaper ads, radio or television broadcasts, or door-to-door flyers. The Ministry of the Environment requires that two of these three forms of notification be used. The local Medical Officer of Health may also take additional measures to ensure the local community is notified prior to adulticiding.

Applying Malathion

Malathion will be applied using truck-mounted, ultra-low volume (ULV) machines. ULV machines dispense very fine aerosol droplets that stay aloft less than 15 minutes, killing flying adult mosquitoes on contact. Since mosquitoes are more active at night, adulticiding would be from dusk to early morning and only when weather conditions are suitable (i.e. light winds, no rain, warm temperature). Again, local residents would receive advance notification of a municipal adulticiding program so they can take appropriate steps to avoid exposure.

Malathion in the Environment

Malathion breaks down quickly in the environment, especially under moist conditions, but some residue may be present on outdoor surfaces after adulticiding. Backyard play structures and playground equipment can be rinsed with water prior to children playing on them the next day. Infants can be placed on a blanket instead of grass if adulticiding was done the previous night. Toys – especially those that infants and children may place in their mouths – should be taken inside before adulticiding takes place or thoroughly rinsed.

If possible, keep your pet inside during adulticiding to minimize exposure. The amount of pesticide that a pet is likely to track into the house will be minimal. Wash your pet's paws if you are concerned. No special precautions or waiting periods are needed for swimming pools.

Avoiding Exposure to Malathion

Health Canada's Pest Management Regulatory Agency has reconfirmed the use of malathion for ground and aerial use in large-scale mosquito disease control programs by ULV application when applied according to label directions. However, steps can be taken if you wish to reduce your indirect exposure to malathion.

Steps you can take before adulticiding begins:

- Cover outdoor furniture, play equipment and wading and swimming pools.
- Close windows, doors and vents.
- Bring laundry and small toys inside.
- Bring pet food and water dishes inside and cover ornamental fish ponds.
- Turn off window air conditioning units or close vents to circulate indoor air (central air-conditioning units can remain running as they do not use outdoor air).

Steps you can take to reduce indirect exposure after adulticiding:

- Windows and window air-conditioner vents can be re-opened after adulticiding.
- If adulticiding has occurred within the past several minutes, minimize your contact with outdoor surfaces and wash skin that has come into contact with surfaces.
- Rinse off outdoor furniture and play equipment with water in the morning.
- Rinse off pool cover before removing.
- If you pick homegrown fruits and vegetables after adulticiding takes place, as with all produce, rinse with water before cooking or eating.

Steps you can take to reduce direct exposure:

- Stay indoors and keep pets inside during spraying.
- If you come into direct contact with malathion such as by being outside during adulticiding, wash exposed skin with soap and water and rinse your eyes with water or saline eye drops. Wash clothes that come in direct contact with malathion separately from other laundry.
- Consult your health care provider if you think you may be experiencing health effects from malathion.

More Information

Additional fact sheets on the use of pesticides in preventing the spread of West Nile Virus are available on the ministry's Web site at:
http://www.ene.gov.on.ca/en/land/index.php

Information on West Nile Virus is available on the Ministry of Health and Long-Term Care's Web site at www.health.gov.on.ca or by calling the toll-free hot line at 1-877-234-4343.

Fact sheets on pesticides for mosquito control are available on Health Canada's Web site at:
http://www.pmra-arla.gc.ca/english/consum/mosquitos-e.html

This fact sheet has been reviewed by the Ontario Pesticides Advisory Committee, a multi-disciplinary committee with expertise on pesticides and pest management.